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## THE Scientific American,

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O. D. MUNN, S. H. WALES, A. E. BRACH.

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### Gravel Walls.

A correspondent inquires of us if gravel walls for houses have been a failure, and if they have, thinks the fact should be extensively circulated as a matter of useful information. We have been told that gravel walls for houses have one bad feature, namely, they admit a great amount of moisture during long rain storms. But for this defect (which can be remedied by a coating of cheap mastic cement,) we are assured they are both cheap, handsome, and durable. But we wish it to be distinctly understood, that no material, however strong, beautiful and cheap it may be for walls, should ever be employed for house building if it does not exclude the moisture in wet weather.

### Another Scientific Expedition.

Professors More and Francis, of Iowa, have gone on an exploring tour to the Andean regions of the Equador. The object is geographical and geological research. They will spend some months among the volcanic regions of the Andes, respecting which little is now known. Such men extend the area of useful knowledge; we wish them success, and a safe return from their perilous enterprise.

### New Barrel Head Machine.

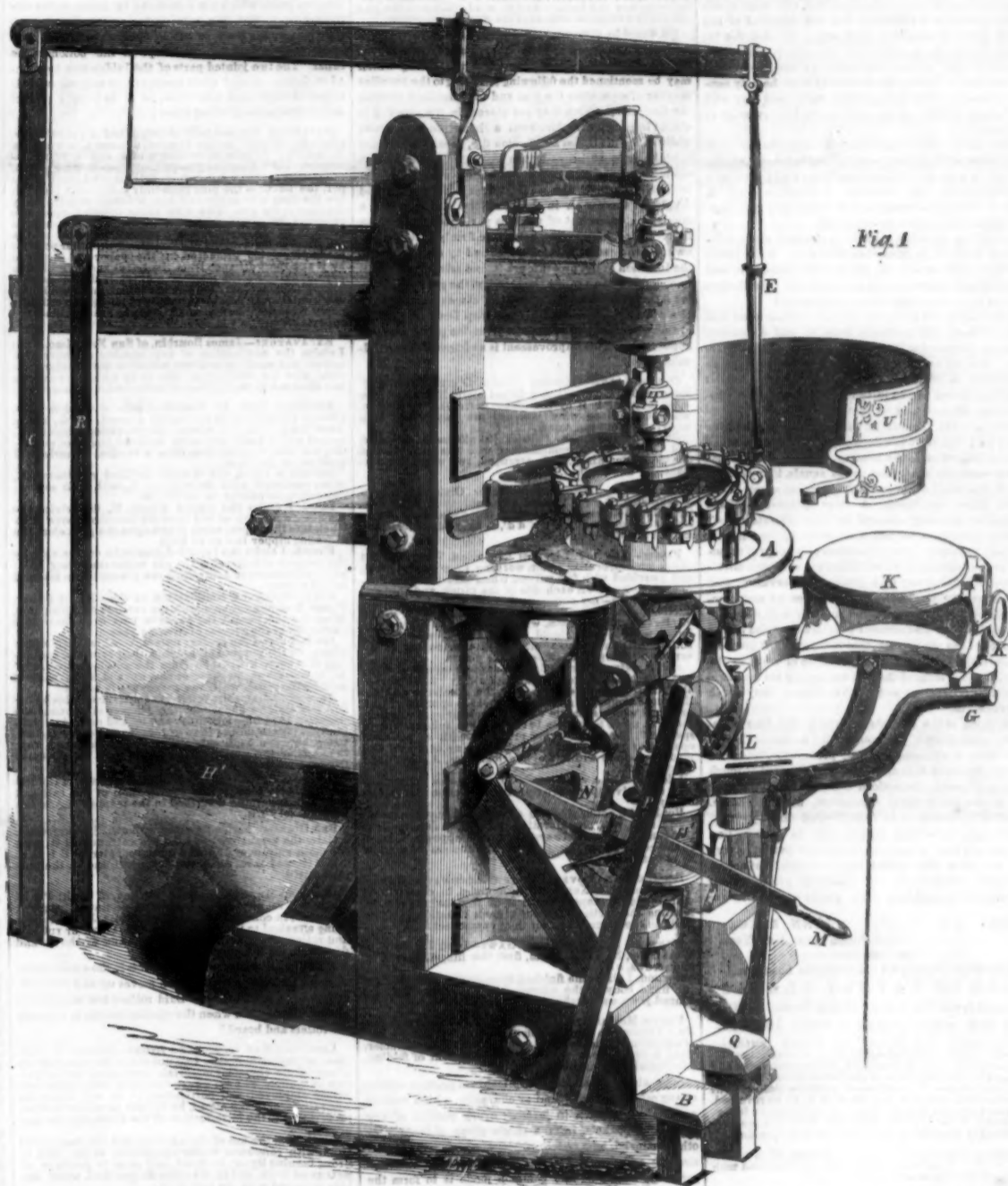
Our engraving illustrates an invention for cutting out and planing barrel heads, by N. W. Robinson, of Keeseville, N. Y. The drawing is from a working machine now on exhibition at the American Institute Fair, Crystal Palace, N. Y., where its operations attract great attention. The rough boards are fed in on one side of the machine, and transformed, with great rapidity, into round barrel heads, planed, beveled, and finished in the most perfect manner.

The heads may be composed of two or more pieces, and the boards, laid side by side, are fed in by rollers, upon the ring bed, A, where they rest. B is a pedal, connecting, beneath the floor, with rod C, and by lever D with rod E. The latter, at its lower end, connects with another ring, F, whose periphery is furnished with a series of clamps or points, each clamp being separate and pressed down by a spring. The boards having been fed in upon ring A, the operator pushes down pedal B, with his foot, which causes ring F, with its many clamps, to press down upon the boards and hold them fast.

The operator now presses down the clutch lever, G, which lifts the revolving shaft, H, and brings the cutters, I, up through ring A, against the under side of the boards. The cutters, I, mark the circle of the barrel head, and cut half way through the boards. The cutter head, J, to which the cutters, I, are attached, is so made that the cutters may be set further in or out from the center, and be thus accommodated to the cutting of different sized heads.

As soon as the cutters, I, have operated, they are lowered, and the swinging bed, K, which is supported and swings on shaft L, is swung under ring A. Lever M is now raised, and by acting through segments, N, and shaft, O, lifts shaft L, carries bed K up through ring A, and presses it against the under surface of the board. Swing bed K thus forms a firm under support for the barrel head. When lever

## MACHINE FOR CUTTING AND PLANING BARREL HEADS.



M is raised, it locks into a notch in rod P, and continues to hold bed K against the bottom of the boards.

The operator now presses down pedal Q which, through rod R and lever S, acts on shaft T, and brings its lower end down through ring F, upon the upper surface of the boards. The lower end of shaft T is furnished with cutters which complete the operation, by cutting through the boards, beveling the edges of the head and planing off its surface, all at once, leaving the head perfectly finished. Lever M is now released, bed K lowered and swung out, leaving upon its surface the barrel head complete. K' is the handle by which K is swung in and out. Shaft T is revolved by means of belt T', and shaft H by belt H'. U is a swinging cover, to prevent the chips and shavings from flying about.

Fig. 2 is an enlarged view of the bottom of the tool holder at the extremity of shaft T, by means of which the head is planed, beveled and cut out. In this figure V is the cutter which does the beveling; W cuts out the head, and X are the planes, which smooth the surface; Y are springs which rest on the barrel head and hold it down.

This machine is strong, substantial, and operates with the greatest success. It dresses the heads to a uniform thickness, or the thickness may be varied at pleasure. We are informed that one man can cut and finish from 150 to 200 heads per hour, with one of these



machines, and more with the assistance of another person. The clamps on ring F being all independent, and each pressed down by its own spring, permits the clamping and cutting

of heads, out of boards of different thicknesses, at the same time. The handling and sorting of the stuff is thus saved. Neither is it necessary to saw the boards up into short pieces, for the machine works up long boards equally as well as short. We are told that by the common hand method of making barrel heads, a man can only make 80 or 100 per day, but by the use of this machine he can make from 1500 to 2000 heads in the same time. The cutters are all arranged so as to be adjustable to cut different sized heads; they may be also easily taken out for grinding, &c. Flat or crowning heads may be cut, as described. Price \$500 and up. For further information apply at the Palace or address the inventor as above. Patented May 6, 1856.

The total amount of foreign emigration to the United States from 1819 amounts to 4,212,624, up to December, 1855. Of these 2,343,445 were natives of Great Britain and Ireland.

Boone's Cordage Machine is advertised in another column.



[Reported Officially for the Scientific American.]  
**LIST OF PATENT CLAIMS**  
 Issued from the United States Patent Office  
 FOR THE WEEK ENDING OCTOBER 14, 1856.

[This invention consists in a peculiar construction whereby the machine is greatly simplified, made to work with a light draft. All the parts which require to be adjusted are located within reach of the driver's seat.

**CYLINDERS FOR COTTON GINS AND MACHINE CARDS.**—John L. Tuttle, of New-York City: I claim the manner described of making cylinders for cotton gins, or for carding or cleaning engines, viz. by introducing the fluid metal, which is to unite the teeth to the cylinder between the cylinders, *a*, *d*, and through the opening *e*, into the space *i*, which unites the whole into one rigid mass, and avoids the danger of irregular flowing of the melted metal, as set forth.

But I claim the combined use of the straight-edge and roller, for stopping and returning the cotton seeds to the east of the machine and allowing the fiber only to pass through, substantially as set forth.

e rotated in either direction, at the pleasure of the  
ator, by turning the handles back and forth in oppo-  
directions, and at the same time pushing it from or  
ing it towards him—the direction of the rotation being

varied by the pushing or pulling of the stock or handle.

[The above invention consists in the application within the tool stock or handle, of such an arrangement of ratchet or rag-wheel gearing, as will enable the tool or instrument to be rotated in either direction at the pleasure of the operator, by turning the stock or handle back and forth, in opposite directions, and at the same time pushing it from or pulling it towards him. By pushing the handle from him the tool or instrument may be rotated in one direction, and by pulling it towards him may be rotated in the opposite direction. It forms a highly useful and convenient instrument.]

**ARRANGEMENT OF THE THILLS OF VEHICLES.**—Noah Warlick, of Lafayette, Ala.: I claim the swinging frame composed of bars a, and b, and braces c, adapted to the reception of either thills or pole, substantially as and for the purposes specified.

**RAILROAD CAR COUPLING.**—John C. Ward, of Charleston, S. C.: I make no claim to a tumbler where a partial rotation effects the coupling, when such rotation is produced by hand; neither do I claim the fastening produced by the rotation of either socket or link, and known as the "bayonet joint" fastening.

But I claim the weighted arm A, stud H, and slide-catch B, in combination with the partially rotating tumbler, which said tumbler constitutes the securing socket, constructed, arranged and operating substantially as described, for constituting a self-acting car-coupling.

RE-ISSUES.

**ARTIFICIAL STONE.**—St. Julien Ravenel, of Charleston, S. C. (Patented Aug. 12, 1856): I claim the composition of marl and slaked lime, substantially in the proportions specified, for producing an artificial stone, or a substitute for stone and bricks.

**SELF-SEALING CANS.**—Robert Arthur, of Philadelphia, Pa. (Patented Jan. 2, 1856): I claim, first, a vessel made with a groove to surround its mouth, prepared with cement, and ready for hermetically sealing, but to hermetically seal itself I make no claim.

Second, I claim the employment of elastic packing, arranged and retained by a groove of an acute form, or whose sides are in close proximity, in the manner and for the purpose described.

**BORING MACHINE.**—Arculus Wyckoff, of Elmira, N. Y. (assignee of Wyckoff & Morrison, of same place.)—Patented Sept. 25, 1856: I claim, first, the tubular or hollow auger or bit, D, as constructed, having the cutting lips of the bits approach to the center, and yet separated from each other, boring without the use of a screw on the end of the bit, for the purpose of preventing the bit from following the grain of the wood.

Second, I claim the worm, operating on its own axle, and independent of the revolution of the auger or bit D, for the purpose of clearing away the chips, as set forth.

[This invention is now on exhibition at the great Fair of the American Institute, Crystal Palace, N. Y. We shall shortly illustrate it by an engraving from a working machine.]

DESIGNS.

Stoves—Hudson E. Bridge, of St. Louis, Mo.

#### Electro-Plating with Aluminum.

[Concluded from page 31.]

**No. 7. To plate with an alloy composed of Aluminum and Nickel.**—We form a bath of alumina according to the solution No. 3, and we attach a pole of nickel, with which we work the bath, supplying the alumina in solution from time to time. A strong battery power may be used for the baths of nickel, but they will work with various powers. Or we add to the bath of alumina a bag of the oxyd of nickel, which we prepare in the following manner:—

We dissolve nickel by nitro-muriatic acid, say one part muriatic and two parts nitric, and precipitate by ferro-cyanide of potassium; we then wash the oxyd, and it is ready to be placed in the bath. If this bath be used with a platinum pole, both the oxyds must be supplied from time to time; if with a nickel pole, the alumina alone must be supplied in solution. Or we take about 4 oz. of nickel, which we dissolve with nitric acid, and precipitate with carbonate of potassium; we then take the oxyd so produced, with about 4 lbs. of carbonate of ammonia, and 4 gallons of distilled water, to this we add about 1-4 lb. of the oxyd of alumina, prepared according to No. 3, boil in an iron vessel, filter the solution, and then it is ready for the bath, which we work with a nickel pole.

**No. 8. To plate with Aluminum and Copper.**—We dissolve alum in water, and precipitate either by carbonate of potassium or carbonate of ammonia; we then filter the alumina, then take the alumina and roast it upon an iron plate until dry; we then place about 4 lbs. of cyanide of potassium in an iron crucible, and completely melt it; we then add about 1 lb. of the dried alumina, and melt this with the cyanide; we then add (by degrees, so as to avoid too violent an ebullition,) about 1 lb. of carbonate of soda, and we fuse these three ingredients together about one minute, at a red heat; we then take about 1-2 lb. of the sulphate of copper, which we add to the fused alumina, and again fuse it with copper, until both are melted, then turn it out on a slab; then place the compound in about four gallons of water, boil it, and filter it, and the solution is ready. This solution should produce a deposit of reddish purple, having the red color of copper influenced by the aluminum. This bath may be worked with a platinum or a copper pole. In the former case the bath must be replenished with the oxyds of both

metals; in the latter case, with alumina in solution only.

**No. 9. To plate with Aluminum, Copper, and Zinc.**—We take half a pound of the sulphate of zinc, which we fuse with the alloy of alumina and copper, as described in No. 8, introducing the sulphate of zinc next, after the copper has been fused with the alumina, and we then proceed to complete the solution as in the foregoing. We then try the bath, to ascertain if there has been a change in the color from the former red color, produced by the bath of copper and alumina, to a color more resembling gold or brass. If it be not sufficiently changed to a yellow tint, which should be the effect of the sulphate of zinc, we add some oxyd of zinc and a further portion of cyanide of potassium. It is preferred to work this bath with a pole of brass, supplying alumina in solution from time to time; and we have found the same results from various powers of the battery.

**No. 10. To plate with an alloy of Aluminum, Silver, and Tin.**—The bath of alumina is made in the same manner as No. 4, with the exception of using 8 lbs. of cyanide of potassium in lieu of 4 lbs. We then take 8 oz. of metallic tin, dissolve it with nitro-muriatic acid, precipitate with salts of tartar, and dry the oxyd; we then melt the cyanide of potassium in an iron pot. We then fuse the alumina and carbonate of soda, as described in No. 4; then add the oxyds of silver and tin to the hot liquor, let it remain a few minutes, dissolve it in about four gallons of distilled water, boil the solution, filter it, and it is ready for the bath. This solution may be worked with a platinum pole, in which case the oxyds of all the metals must be supplied; or it may be worked with a pole of silver and tin, in which case the alumina alone must be supplied, and a moderate battery power should be employed.

**No. 11. To plate with Aluminum and Iron.**—We use a bath of alumina, prepared as before named; then take sulphate of iron and dissolve it with water, precipitate with salts of tartar, filter it, then take the oxyd of iron, and add to the solution of alumina, in the proportion of about 1 lb. of the oxyd of iron to 4 gallons of the solution of alumina; boil them together, filter, and the solution will be ready for use. This bath may be worked with a platinum pole, and the strength of the bath is sustained by adding the oxyd of aluminum and the oxyd of iron from time to time. If aluminum or the alloys of aluminum with other metals be required in a solid state, it or they may be deposited, as before described, on a metal which melts either at a higher or lower temperature than the aluminum, or the aluminum and its alloys, or upon a metal that is harder than the deposit, and the deposit can then be separated by heat or by scraping, and the aluminum or aluminum and its alloys, so obtained can be consolidated by processes already known.

#### The Steam Frigate San Jacinto.

**MESSENGERS.**—In reading the first number of this volume of the SCIENTIFIC AMERICAN, we noticed the remarks about the *San Jacinto*, and believing that you have no wish to do us an injustice, we send you the following information:—The present machinery of the *San Jacinto* was completed by us in July, 1854, and up to the present time (propeller excepted) has given entire satisfaction. The first propeller was seriously injured (while at the Navy Yard here, previous to her trip to Europe) by being suddenly stopped, when making thirty-three revolutions per minute, by a large timber floating into the propeller well. As the injury was not visible, the ship sailed, and broke a blade when going to the Baltic. On docking the ship it was found to be the injured blade that was lost, and a previous fracture of considerable magnitude observed. The subsequent breaking of the second and third blades followed as a natural consequence the breaking of the first. The present reports of the breaking of the machinery are all untrue, and are based on the following circumstance:—After steaming to China, they left for Japan; just after leaving port a slight jar was observed in the propeller and on examining it, it was found that the key which

held it on was becoming loose. As there was a dock in China where it could be secured and none in Japan, the engineer advised returning to port, and hence the various reports as to her breaking down, etc.

In sending you this information we have no desire to be ourselves known in print, but simply to give the facts of the case.

MERRICK & SONS,

By B. H. BARTOL.

Philadelphia, Oct. 11th, 1856.

[For the Scientific American.]

#### Growing the Chinese Sugar Cane.

**MESSENGERS.**—As the Chinese Sugar Cane is attracting the attention of the community, and as it is likely to be of great value to the farmers of the United States, and as you have given us an article on this subject in No. 1, Vol. XI, of the SCIENTIFIC AMERICAN, I thought I would write down and send you the result of my own experience in the growth of this plant.

Some time during the last winter I obtained about three hundred seeds of the "Sorgho Sucre" from the Patent Office, which I planted on the 1st of May last, on land that had been cleared three years ago. I laid the field off in checks three feet apart for corn. In some of these hills I planted the seeds of this sugar cane, dropping eight seeds in a hill, making thirty-seven hills in all. I worked the cane precisely as I did the corn, giving it three plowings and three hoeings. In four months from the time the seed was planted the cane was fully matured. It then measured ten feet six inches high, and one inch and three-eighths in diameter at the butt end. The joints average twelve in number to the cane, measuring from six to eleven inches long, the shortest at the bottom and the longest at the top. As soon as the seed was ripe, another head of seed put up out of the second joint from the top, and in a short time grew as high as the original head, though not quite so large. By the time the seed on this head began to turn dark a third head sprung up from the third joint, which was about the size of the last head, and now a fourth head is making its appearance from the fourth joint. Where this shooting forth of new heads would end, if no frost should come to kill it, I cannot tell. The roots, where I cut off some of the canes some time ago, are sending up new sprouts, some of which are four inches high. I am of the opinion the *Sorgho Sucre* is a perennial plant, and would grow all the time if there were no severe cold to kill it. It appears to surpass anything we can plant in producing fodder for cattle. There are commonly twelve leaves on a cane, and these measure, on an average, three feet long, and three inches and a half broad. We commonly plant two stalks of corn in a hill. I had eight canes in the same space, each cane producing full as much fodder as one stalk of corn. At this rate, which is to me matter of fact, one acre of cane will produce as much fodder as four acres of corn. But I am persuaded that I might have planted the cane in drills of three feet apart, dropping eight seeds in every space of eighteen inches, and by this means have eight times as much fodder as corn would produce.

One head of seed that I picked up at random measured three gills, and one gill contained eight hundred seeds. I then selected a large head, and measured it, and found it to contain four and a half gills of seed. The 37 hills that I planted produced three pecks of seed, this, after drying it two days in the sun, weighed 32 pounds. I had no mill to squeeze the cane, in order to make experiments in syrup and sugar. I made a little roller, which I thought might press out some of the sap, but it was a failure, for want of sufficient power. It flattened the cane, but did not press out the sap, of which the cane appeared to be full. I twisted a joint in my hands after being flattened with the roller, and obtained about half a gill of sap, which was as sweet as any of the sap of the sugar cane of the south. I intend, Providence permitting, to plant at least half an acre next spring, and procure a proper mill and boilers, and make a thorough experiment.

Jos. McKen.

June, Lumpkin Co., Ga., Sep. 1856.

[For the Scientific American.]

#### The Action of the Galvanic Battery.

In S. B. Smith's answer, on page 19, SCIENTIFIC AMERICAN, to M. Vergnes, I was surprised to see him attempting to prove his theory of the electric current taking the surface of fluids in preference to descending into them, by stating the well-known fact of the positive pole in solution being more rapidly dissolved at the top than at the bottom, when in reality this action arises from a totally different cause. It is well known to chemists that all metallic solutions, if allowed to stand, become more dense as you descend below the surface, from the fact that the heavier portions of the fluid settle to the bottom until the lowest stratum becomes nearly or quite saturated with the metallic salt, and finally crystallizes on the bottom of the vessel, while the top of the fluid is comparatively free of metal. If a solution of cyanide of silver and potassium be set aside for twenty-four hours, it will be found, upon examination with the proper instrument, to contain 50 per cent. more silver at the bottom than at the upper stratum of fluid. If any person will examine a negative plate in a battery after an action of a few days, he will find the silver deposited two or three times heavier at the lowest extremity than at the upper. Now the reason why the positive pole is more rapidly dissolved at the upper part is this: The solution being nearly saturated with metallic acid at the lower portion, there is little or no free solvent to attack the positive plate at that point, while, on the contrary, at the upper part of the liquid there is a large quantity of free cyanide ready to take up the metal when the action begins. In the process of precipitation, the lower part of the liquid, instead of supplying itself from its own part of the positive plate, is actually being fed from the top, and by a close examination the two currents can be distinctly seen with the naked eye, the one saturated and slowly descending from the positive pole, and the other having deposited its burthen of metal, rapidly rising to the top to again receive its load of precious metal, thus producing a continual circuit, as long as the action goes on. This inequality of density in metallic solutions is more distinctly seen in a sulphate of copper solution than any other. If the positive plate be set flat down at the bottom of the solution, and the negative at the top, and left in action a few hours, it will be found that the top of the liquid is entirely robbed of metal, while the bottom is so completely saturated that large crystals are forming upon the positive pole, and entirely obstructing the electric current—crystallized metallic salts being non-conductors.

JAMES POWELL.

Cincinnati, O., Sept. 30, 1856.

[We have also received a letter from Geo. H. Guild, of Lexington, Ky., on this subject, confirming the statements of Mr. Powell. He says:—

"Having had several years' experience in the silver plating business, I believe the plate is decomposed according to its density, and in no case yet, where I used a plate of uniform density, have I found it more decomposed at the top than at any other point of its contact with the solution, Mr. Smith's assertion to the contrary notwithstanding. I have specimens with the center entirely gone, others with the lower corners and edges gone. Mr. Smith scouts the idea of the irradiation of electricity being governed by the same laws as those of light and heat. If there is no irradiation to electricity, how is it that an object subjected to the silver plating process is plated with a uniform coat at the lower extremities, as well as at the surface without regard to the size of the silver plate immersed?"

Stove Polish.

As the period has arrived for the polishing up of stoves for winter use, we have a good word to say in favor of the polish prepared this year by Quarterman & Son, No. 114 John street, this city. Excellent though their former polish has always been, they have made a decided improvement on it this year; it far surpasses anything of the kind we have hitherto tried.

The steamship *City of Savannah*, sprung a leak on the 12th inst., off Cape Hatteras, and soon sunk; officers and crew were all saved.

## New Inventions.

## New Mill Stone Dress.

Mr. W. P. Coleman, of New Orleans, La., has lately patented a mill stone dress, the furrows of which are arranged in a peculiar way, whereby the grain is retained between the grinding surfaces of the stones a requisite length of time, and the surfaces of stones at all times supplied with a proper quantity of grain. The surfaces of the two stones are thus prevented from coming in contact with each other, a much larger amount of grain can be ground, while the quality of the flour will be improved. It is an important and valuable invention.

## New Mode of Bending Wood.

Messrs. E. A. & C. Kilburn, of Burlington, Vt., have lately patented a method of bending ship's knees, and which consists in forcing the stuff endwise into a close sided mold, having the desired curved form longitudinal, and having its interval transverse section only just of the dimensions of the transverse section of the piece of wood. The wood is thus confined laterally, in all directions, during the bending process, and is thereby prevented from breaking, splitting, or splintering.

## The Great Bridge at Montreal.

This immense structure forming part of the Great Trunk Railroad of Canada, has been pushed forward with considerable energy this summer by A. M. Ross, the resident engineer; but even with the greatest efforts, it is believed that it cannot be completed within two years. And when its gigantic proportions are taken into consideration this will excite no wonder. The mason work alone will amount to 28,000,000 cubic feet, and the iron tubing will weigh 11,000 tons. When completed it will be the greatest bridge in the world.

## New Marble Sawing Machine.

Our engraving illustrates a novel machine for sawing marble blocks, by C. A. Schultz, of Chicago, Ill., which is now on exhibition and in operation at the American Institute Fair, Crystal Palace, N. Y. It is the only operating machine of the kind exhibited.

The principal feature of novelty consists in the employment of endless saws, A, which are strained around the pulleys, B, like endless belts. The pulleys are made of such a diameter that the saw blades will not bend in passing around them, but simply spring, so that no injury to the saws takes place, no matter how rapidly the pulleys move.

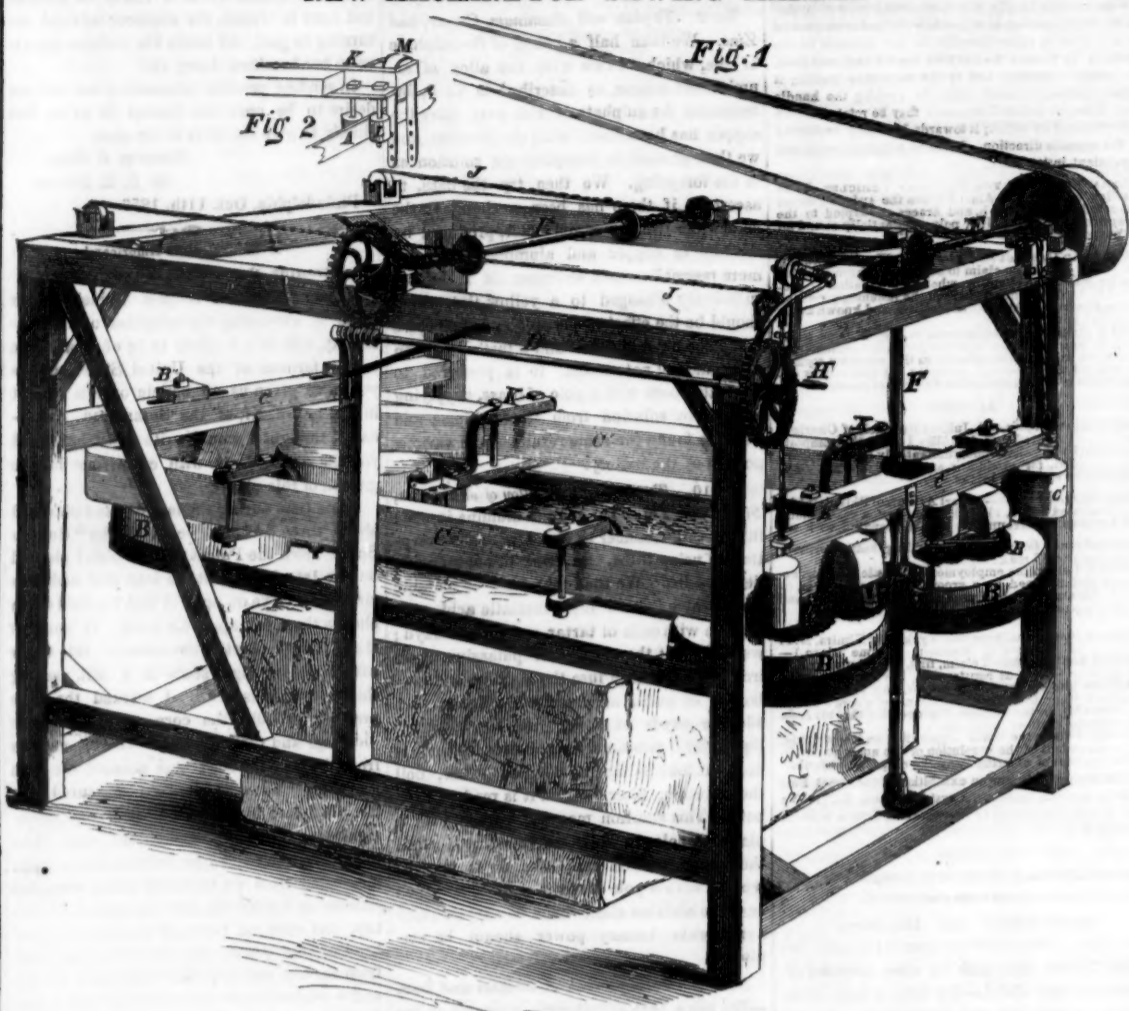
The pulleys and saws are carried in a frame, C C', which has a vertical movement within the main frame of the machine, D. Motion is given to the pulleys, B, and saws, A, by means of power applied to shaft E, which causes the vertical shaft, F, to rotate. G is a pinion on shaft F, which drives the pulley pinions, B'. Pinion G revolves with shaft, F, and also rises and falls upon it.

In order to introduce the block of marble the frame, C, with the saws, A, pulleys, B, pinions, B' and G, are raised vertically by turning the crank, H. This operates shaft, I, and winds up the lifting cords, J, which are attached to the four corners of frame C. The block of marble having been placed in position, frame C is allowed to descend, and the saws are brought upon the top of the block of marble. The weight of frame C then serves to give the required downward feed to the saws.

The saws are readily set to cut at an angle, and thus produce tapering blocks for monuments, by altering the position of the frames, C. Said frames are so arranged as to be near together, or moved apart, at pleasure, by means of set screws, B'. The frame, C', is divided into two parts, each portion carrying a saw, and being separately adjustable. Adjustable guides, K, are also attached to frame C', for the purpose of guiding the saw. Guides K are furnished with friction rollers, L M, between and beneath which the saw passes (see fig. 2.) Each saw makes two cuts, which are perfectly true and smooth.

The saws are made of common hoop iron, and therefore cost but very little. We are

## NEW MACHINE FOR SAWING MARBLE.



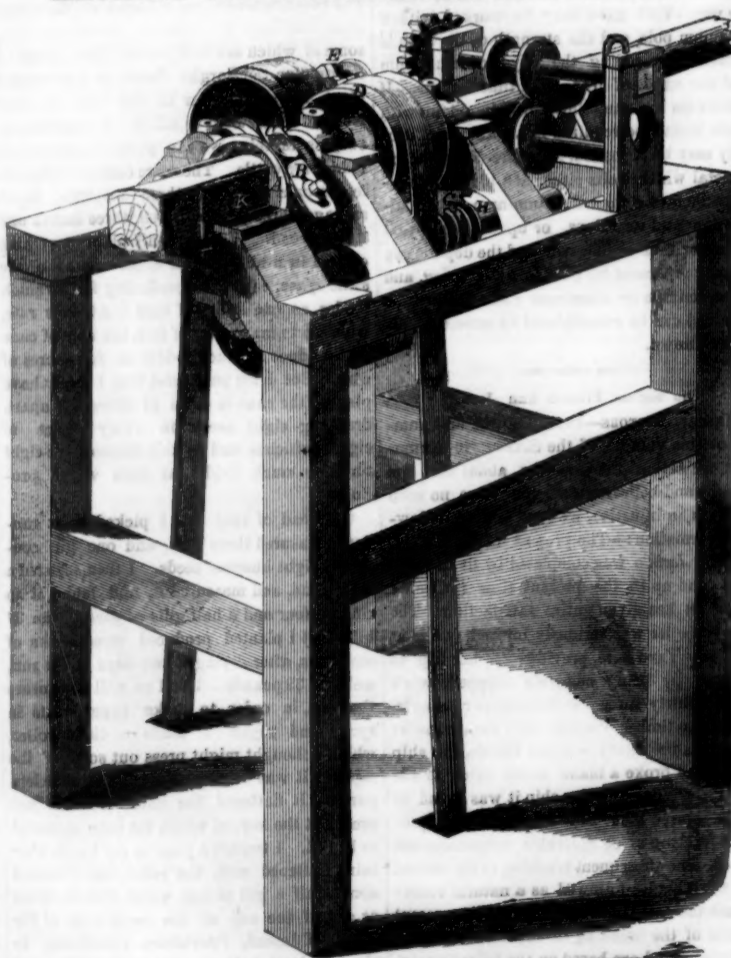
told that this machine cuts about three times faster than the common marble sawing apparatuses. The endless saws may be driven at a high speed, their motion is always steady,

and there is no appreciable wear on their surface. No difficulty is experienced in feeding in the sand.

The machine at the Palace is of full size,

and operates with entire success. Further information can be had at the Palace or by addressing Fulton, Perkins & Co., box 698, Chicago, Ill. Patented March 18, 1856.

## MACHINE FOR TURNING BEDSTEAD RAILS.



## New Bedstead Rail Machine.

Our engraving illustrates a machine for turning Bedstead Rails, now on exhibition at

the American Institute Fair, Crystal Palace, N. Y. It is the invention of T. R. Bailey Lockport, N. Y. Patented July 25th, 1854.

This machine is intended for the turning of plain round rails for the cheaper kind of bedsteads, and also for all kinds of plain round turning, such as posts, window curtain rollers, pickets, rake bows, &c.

In our cut, A is a revolving mandrel, made hollow. B C the cutters. The rough rail is turned by being passed through the mandrel. At the entrance or mouth of the mandrel there is a stationary guide plate, K, through which the stuff passes. The rail is fed in by hand for a short distance, or until its forward end comes between the rollers, I J; these rollers then seize the stuff and carry it through, without assistance from the operator. E is another revolving hollow mandrel for cutting tenons on the ends of the rails, for screw bedsteads. The tenon produced is of the usual shape. Both of the mandrels are driven by one belt D. The machine is strong, durable, very simple, easily managed, and not liable to get out of order. It works with great rapidity, being capable of turning out 600 to 800 bedstead rails per day of ten hours. Price \$150. For further information apply at the Palace, or address the inventor as above.

The propeller *Falcon* was burned at Chicago on the 17th inst.

## SPLENDID PRIZES.—PAID IN CASH.

The Proprietors of the SCIENTIFIC AMERICAN will pay, in *Cash*, the following splendid Prizes for the largest Lists of Subscribers sent in between the present time and the first of January, 1857, to wit:

For the largest List,	\$200
For the 2nd largest List,	175
For the 3rd largest List,	150
For the 4th largest List,	125
For the 5th largest List,	100
For the 6th largest List,	75
For the 7th largest List,	50
For the 8th largest List,	40
For the 9th largest List,	30
For the 10th largest List,	25
For the 11th largest List,	20
For the 12th largest List,	10

Names can be sent in at different times and from different Post Offices. The cash will be paid to the order of the successful competitor, immediately after the list of January, 1857. See Prospectus on last page.

## Scientific American.

NEW YORK, OCTOBER, 25, 1856.

## Failure of the Steam and Ether Engines.

Many of our readers will remember the flattering accounts that were published in various papers, respecting the wonderful success of the combined steam and ether engines of M. Du Tremblay, of Paris; and how their application to some steamers engaged in the Mediterranean trade had, by their superior economy of fuel, enabled their proprietors to pay a dividend of forty per cent. in January 1855. A correspondent at Marseilles, in a letter to us, on page 251, Vol. 11 SCIENTIFIC AMERICAN, corrected some of the extravagant stories then in circulation, yet he also stated that the combined ether engines were a success,—that they saved 60 per cent. of power with the same fuel,—that they had been applied to several steamers, and that four more were then in the course of construction. We had expressed the opinion that we could not see how such a gain of power, and such profits, could be realized, and stated, in our remarks at the end of that correspondent's letter, that, taking all things into consideration, simple steam engines were preferable.

We learn by the last number of the *London Artizan*, that two of these steamers—*Le Jacquard* and *P. Arago*—belonging to the Franco American Company, were lately taken to one of the Graving Docks, at Southampton, for repairs, and were objects of curiosity to English engineers. The combined engines, were well made, and the whole machinery unexceptionable in construction, but *Le Jacquard*, which was first afloat, used the ether cylinders only during three or four voyages between Marseilles, and the Crimea, then gave them up, and used the steam alone; while *P. Arago*, which was launched afterwards, never used its ether cylinders at all. Thus the ether engines are a dead loss,—entirely useless, while the simple steam engines alone are now used to propel these vessels.

It is stated that the cause of the failure of ether engines arose from the difficulty in keeping the ether vapor from escaping through the stuffing boxes. The loss is stated to have been about thirty-eight and a half gallons of ether daily, valued at ninety dollars,—a loss far too great to be compensated by the reputed economy of fuel, and no wonder it was abandoned.

It is, however, still asserted that the ether cylinders economized about 60 per cent. of the power, and that, were it not for the loss by the escape of vapor, they would effect a great saving; these views are presented by a correspondent of the *Artizan*. We believe that, although there was not a particle of loss by the escape of the ether in such engines, the simple steam engine is still preferable. The economy of power said to be effected in *Le Jacquard* when the ether engines were used, is based upon the work now executed by the steam engines on board that vessel. This is not a fair comparison, for the steam cylinders employed were designed to work steam of 35 lbs. pressure, to be exhausted at the end of the stroke into the ether vaporizers; they are consequently too small to work the same amount of steam alone, to advantage. If the small steam cylinders of 64 inch bore were taken out and new ones of 80 inches bore put in, and the steam cut-off at half stroke, they would be found to work as economically with respect to a saving of fuel, as the ether and steam cylinders combined. When it is taken into consideration that beside a steam engine in each vessel, there was an ether vaporizer, resembling a large flat tubular condenser, and two ether cylinders, with all their connections, valves, and rods, the great loss sustained by this company in adopting them—now that they are abandoned—may be conjectured.

## Mexican Emigration.

Since the appearance of our article on the Colonization of Mexico, we have had several letters of inquiry from young men, as to the propriety of emigrating to that country. Such letters should not be addressed to us, as we are unable to answer them. Our notice was based upon a pamphlet issued by a Mexican

official, who has quite recently returned to his own country.

## Bitumen—Its Uses.

This is a name employed to denote various inflammable substances found in the earth. There are a number of different kinds of it, most of which pass into one or other, from petroleum—the most fluid—to asphalt, which is sometimes too hard to be scratched with the finger nail. Extensive magazines of it are found in various parts of the world. "Elastic bitumen" is of a brown color, and erases pencil marks like india rubber, hence it is called mineral caoutchouc. "Compact bitumen," or asphalt, is extensively disseminated, and is found in great abundance in some of the West India Islands, and New Brunswick, N. A. It is black, and of a hard resinous appearance. The Pitch Lake of Trinidad yields bitumen in all conditions. Petroleum is fluid bitumen; it is of a dark color, and oozes from certain rocks and crevices in the earth, and becomes solid by exposure to the atmosphere. Naphtha, or mineral oil is another variety of it, which becomes petroleum by exposure to the air. Petroleum is common in various parts of the United States, such as at Kenawha, Va., Scottsville, Ky., Oil Creek, Pa., Liverpool, O., Hinsdale, N. Y., and it was at one time collected by the Seneca Indians and sold in the market as a lotion for rheumatic affections and bruises. It is in the form of petroleum that bitumen is most common in our country, and but very little use is made of it, owing, we suppose, to its pungent smell. In Burmah it is used for fuel and illumination; and mixed with soap, is said to form an excellent remedy for many cutaneous diseases, a protective against the prickly-heat of warm countries: and was supposed, at one time, to be a remedy against cholera.

It is a remarkable fact in the history of the useful arts, that asphalt, which was once so generally employed as a durable cement, should have almost fallen into disuse for thousands of years. It resists the passage of air and moisture, and has therefore a most valuable quality for lining cisterns and the interior of deep cellars. Bricks or stones coated with hot bitumen resist moisture, and are rendered proof against decay by changes of weather. Possessing these valuable characteristics, it is wonderful that it is so little used. Some attempts have been made in this city to make a concrete pavement of it, such as at the building on the corner of Beekman and Cliff streets, but for this purpose it is evidently not equal to stone flags, because it has had to be relaid, and now huge cracks are again seen in different parts of it. On the other hand some beautiful mosaic asphalt pavement, has been laid down in the streets of Paris, and is said to be perfectly successful. All the volatile oil and water should be expelled from bitumen by boiling before it is applied as a cement, or it will not resist the changes of heat and cold well. Many failures in the employment of pitch and bitumen for cement have been caused by neglecting to boil it thoroughly. It is our opinion that iron pipes, coated inside and out with hot bitumen, especially the elastic kind, will prevent incrustation inside, and render them very durable. And may not this substance be so manipulated, that it can become a substitute for india rubber and gutta percha? These vegetable resin gums are becoming dearer year after year, and are only obtained in limited quantities and at considerable expense. On the other hand bitumen is found in exhaustless quantities, and is very cheap. Can it not, by some chemical process, be rendered as elastic as these gum resins, and as capable of vulcanization. Here is a field, we think, of great extent for chemical experiment, to which we invite attention.

## Commissioner's Report for 1855.

We are indebted to the Hon. Chas. Mason, Commissioner of Patents for copies of his Annual Report for 1855. The work is published in two volumes of equal size, and contains the claims of all patents granted for that year, together with outline diagrams of their prominent features of novelty. The general plan and arrangement of the Report is excellent and the execution good.

Great Exhibition of the American Institute at the Crystal Palace, New York.

## FIFTH WEEK.

The Fair continues to attract thousands of visitors from all parts of the country. The day fixed for the closing was October 25, but we presume the time will be extended until the public attendance materially diminishes.

During the past week the Annual Cattle Show of the American Institute has taken place, the locality selected being Hamilton Square, a large open lot in the upper part of the city. The *New York Tribune* intimates that the award of prizes was influenced by bribery. The judges give a list of the successful competitors; but no statement of the reasons for their decisions is made public. This Cattle Show appears to have been attended with no special result.

We continue our usual reports of the novelties on exhibition. Besides those annexed, it will be observed that our illustrations this week, are nearly all taken from objects at the Palace. Another noticeable fact is, that nearly all of the most prominent objects, in the mechanical line, in the Exhibition, have been illustrated and described in the SCIENTIFIC AMERICAN.

## Printed Muslins.

The Dunnell Manufacturing Company at Providence, R. I., exhibits a case of well-executed calicoes, and the Manchester (N. H.) Print Works display a case of fine muslin de laines and calicoes; but the Pacific Mills, Lawrence, Mass., make the greatest show of printed goods. Fine lawn muslins, manufactured at the Portsmouth Steam Mills pleased us both on account of the quality of goods, and the elegance of their design; the checked organ-dia, calicoes, and delaines exhibited by this company give evidence of good taste and the variety of work they execute. There is no branch of art connected with manufactures, which embrace more varied skill, knowledge, and taste, than calico printing. The bleaching, dying, and color-making departments, demand great chemical experience; the patterns require great taste in designing, and skill in engraving, and the machinery for executing the various kinds of work, is complex and ingenious. It affords us pleasure to be able to pay a compliment to the printed goods displayed at this Fair. They undoubtedly show a great improvement in design and coloring in comparison with the flashy vulgar dubs that were fashionable a few years since. It is our opinion, that the public taste has not been improved by the abundance of coarse mixed goods, half cotton half wool, now so common; a finer quality of fabric, all cotton, is not only more beautiful, but more durable. The superior qualities of calicoes, manufactured in France, Belgium, and England, are beautiful fabrics; we wish that some of our manufacturing and printing companies would pluck up spirit enough to produce as good fine calicoes as the foreign, before the expiration of another year.

## Spring Beds.

Messrs. Lippencott & Co., 1180 Broadway, N. Y., exhibit Wright's Patent Sectional Spring Bed. The elasticity is obtained by the employment of a series of spiral springs, composed of strong wire, each spring having a round seat and a head of wood. These springs form a cheap, durable, and comfortable bed. For engraving and description see SCIENTIFIC AMERICAN, Vol. 11, page 340.

Wagstaff & Co., 499 Broadway, exhibit specimens of Howe's patent spring beds. The springs are single boards, shaped somewhat like one half of an elliptical carriage spring. They are stretched across the bedstead. Cheap and simple.

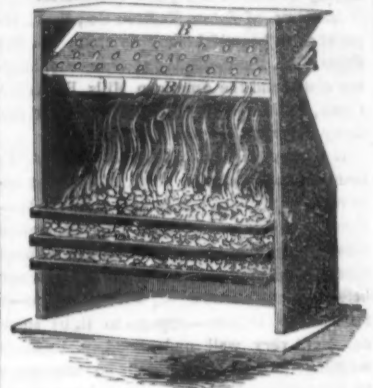
## Steel Pens.

The great seat of the steel pen manufacture is Birmingham, Eng.; there the art originated, and there it is still carried on to an immense extent. This peculiar manufacture, after repeated efforts, may be said to have attained to success among us. The American Steel Pen Manufacturing Co., of New York, exhibits a case of excellent pens in the South Gallery. Each pen has a stamped medalion likeness of Washington on it, for which a patent was obtained, as a design, on the 15th of April last. We have tried these pens, and can give them a good recommendation; still, we have used

some English pens which were better. Our steel pen manufacturers will, no doubt, soon produce pens unsurpassed, if not superior to the best Gillott.

## Grate Damper.

Messrs. Jacob Cohen & Co., exhibit in practical operation, one of their improved grate dampers, illustrated in the annexed cut.



A is the damper, which, it will be seen, swings on pivots, and is perforated with a number of small holes. With the exception of the damper, the grate is constructed in the ordinary manner. In lighting the fire, when a strong draft is necessary, the damper A is opened. But after the fire begins to burn well, the damper is turned so as to close the openings into the chimney, B, and present a reflecting surface to the calorific, of similar angle to the back piece, C. When closed, the damper, A, throws out all the heat of the fire into the apartment, but the gaseous products of combustion are drawn off through the perforations, and pass up the chimney.—We are told that this damper effects a saving of fifty per cent. in fuel, and gives the highest satisfaction wherever used.—Price \$3 and upward, according to size. Further information can be had at 407 Broadway, N. Y., or at the Palace.

## Improved Grooving Plane.

Mr. John P. Robinson, of Matteawan, Dutchess Co. N. Y., exhibits his patent Grooving Plane, which is shown by the accompanying engraving.



The plane stock, A, it will be seen, is made of triangular shape, and the cutting tool, B, which is quite narrow, projects at the apex of the angle. The plane is moved like the ordinary tool.

Every variety of groove, square, angular, or round, of the same dimensions or tapering in form at the pleasure of the workman, can be cut, with the utmost facility and rapidity. No circle is required to be struck, and a saving of 50 per cent. in time is gained. The plane is chiefly intended for the use of pattern makers in working out core boxes. It is in use in the pattern shops of the Novelty Works, in this city, at Starbuck's, Troy, &c., where it gives the highest satisfaction. Price \$2.50. For further information address the inventor as above. Patented Dec. 18th, 1855.

## Woolen Cloths.

Marked improvements have been made in the manufacture of woolen cloths during the past few years: even the satinet are more like broadcloth than those so common a few

years ago. Wales & Co., of Wales, Mass., and Messrs. Hilliard & Spencer, of Manchester, Conn., exhibit some pieces of fine satinetts. The color and finish of all these goods are excellent.

Cassimeres appear to be the most common woolen cloths at the Fair; the Middlesex Co. Lowell, Mass., exhibit a number of pieces; the Powhattan Co., Moosup, Conn., make a large display of ribbed and plain cassimeres.

A. Morse, of Eaton, Madison Co., N. Y., exposes some beautiful black doeskin; the Bay State Mills, Mass., display some excellent beaver cloth, and the American Mills, Rockville, Conn., exhibit a few pieces of double-fold fancy cassimere, of very good quality.

It requires a large capital to conduct the manufacture of woolen cloth on the most approved principles, to produce fine goods.—Fresh wool does not work freely, therefore wealthy manufacturers have always a large stock ahead, so that it can attain a proper age before they commence to work it. Age—a few months, at least—imparts to it, by some cause not very well understood, a superior working quality, which gives an advantage to companies who can lay up a large stock. A great desire to produce cheap goods with a good surface has led woolen manufacturers to use too much cotton in their warps. They display much skill, we admit, in covering it up with the wool; but such goods after a little wear, become bare, and fade in color, and they do not possess that soft and agreeable feeling to the touch that belongs to goods made entirely of wool. We have seen statements in some of our daily papers to the effect that American wool was not sufficiently fine for the manufacture of the finest kinds of woolen cloth. This is an error. As fine qualities of wool are now raised in the United States as can be found anywhere. We only wish that there was more of it. According to the capacities of our country for sheep-grazing, not a tithe of wool is raised that might be.

#### Pianofortes and Melodeons.

Messrs. R. G. Nellis & Co., 547 Broadway, N. Y., exhibit one of Speer and Marx's patent (1852) Cylindron, or Cylindrical Pianofortes, which presents a very beautiful and ornamental appearance. It occupies a prominent position in the central part of the Palace, and is the "observed of all observers." The principal feature of novelty consists in having the strings arranged around an upright hollow cylinder, which forms the sounding-board. It is alleged that a cylindrical sounding-board acts on the principle of a drum, and gives a certain roundness, fullness, and richness of note which the ordinary instruments do not possess. Another advantage is that two pianos may be combined in one, with but little increase of space. Thus the instrument at the Palace has two key-boards, and is, in fact, a double piano. It is elegantly finished and makes a fine display. The position in which it is placed, however, is very bad for sound, and the merits of the invention are, therefore, not so fully apparent as they otherwise would be. Mr. R. G. Nellis uses, in connection with the instrument, a recently-patented contrivance relating to the working parts. For an engraving and full description of the Cylindron see SCIENTIFIC AMERICAN, Vol. 8, page 73.

William Miller, 158 East 21st st., New York, exhibits several improved pianos, the novelty consisting in stringing some of the lower or bass octaves over the center of the sounding-board. The wires for these octaves extend the whole length of the piano. It is claimed that instruments thus made have a certain richness and fullness of sound that other pianos do not possess.

Messrs. Chickering & Co., Boston, Mass., exhibit a magnificent grand piano, and several others, large and small, which evince the most careful and excellent workmanship.

Henry Hanson, 100 Center st., New York, exhibits a new diagonal scale piano.

William Compton, 103 East 40th st., exhibits a patent arch-shape rest, plank plate, and, reversible bridge piano.

Anthony Kuin, Baltimore, Md., exhibits a grand patent Harp Dulciana piano. It is a beautiful object. A large and splendid harp

crowns the upper part of the instrument, whose strings, when the keys are played, send out delicious sounds.

Among other fine specimens of pianos and melodeons we notice those exhibited by T. Gilbert & Co., Boston, Mass., Taylor & Farley, Worcester, Mass., Earnest Gabler, N. Y., Grovesteen & Truslow, N. Y., Horace Waters, N. Y., Schultz & Ludloff, N. Y., Steinway & Sons, N. Y., Theodore Roz, N. Y.

#### Broadcast Seed Sowers.

H. Willard, of Vergennes, Vt., exhibits some of his lately patented seed sowers, which present a novel and practical appearance, and attract considerable attention among agricultural visitors. The machine consists of a two wheeled vehicle, which carries two small revolving seed cylinders, which scatter the seed upon an inclined board, whence it falls to the ground. The inclined board is furnished with certain upright slats or guides, which insure an even scattering of the seed upon the ground, no matter whether the surface is level or hilly. A rotary harrow is attached behind, which covers the seed as fast as scattered. The seed falls only between the wheels of the vehicle, so that the operator is never in doubt as to where the grain is spread. The machine can be readily adjusted to sow in hills or in drills. The driver rides upon a convenient seat. Several other important advantages are secured which our limited space prevents us from naming. For engraving and description see SCIENTIFIC AMERICAN, Vol. 11, page 361.

Wm. S. Sampson, of Boston, Mass., exhibits a broadcast sowing machine. It is in the shape of a hand-cart, and it is said will sow forty acres per day, at an expense of 3 cents per acre.

#### Hay and Cotton Presses.

C. J. Fay, of North Lincoln, Me., exhibits a full sized hay and cotton press, which is very strong, durable, and simple. Price \$100. For engraving and full description see SCIENTIFIC AMERICAN, Vol. XI, page 249.

G. D. Harris, of Pittsburgh, Mass., exhibits one of Ruggles' Patent Combined Cotton and Hay Press and Stamp Puller. By a very simple and compact arrangement of a lever frame and gearing, a tremendous power is exerted upon the substance pressed. Or the press may be quickly disconnected, and the machine used as a stump puller, or for moving buildings, raising burdens, etc. Price \$100 and up. For an engraving and full description see SCIENTIFIC AMERICAN, Vol. XII, page 5.

Farmers and Mechanics Manufacturing Co., of Greenpoint, L. I., exhibit Ingersoll's patent Hay and Cotton Press, which possesses the merit of cheapness, compactness, simplicity, strength, durability, ease, and rapidity of operation. Price \$50. See engraving and description in SCIENTIFIC AMERICAN, Vol. 11, page 233.

W. Deering & Co., Albany, N. Y., exhibit Dederick's Patent Parallel Lever, Cotton, and Hay Press. It is claimed for this machine that the follower can never cant or bind against the sides of the press. It operates with great power and speed. Two men and a boy, it is alleged, can bale from five to nine tons of hay per day. Price \$100 and up. See engraving and description in the SCIENTIFIC AMERICAN, Vol. 11, page 384.

James A. Diabrow, of Poughkeepsie, N. Y., exhibits a new press, which will be found fully illustrated and described in the present number of our paper.

#### Cow Milking Contrivance.

John W. Kingman, of Dover, N. H., exhibits an air-tight milk pail, from which the air is exhausted by means of a small lever or pump handle. Four flexible tubes, each having a rubber pocket at its extremity, receive and clasp the cows' teats. By pumping with the lever the air is exhausted from the pail and suction produced upon the teats, which causes the milk to flow rapidly into the pail. This contrivance is said to be a good one, and to operate with success. It certainly has the merit of cheapness and simplicity.

#### Fruit Grinder and Press.

Wm. O. Hickock, of the Eagle Works, Harrisburgh, Pa., exhibits a newly patented portable apparatus for grinding and

pressing fruit of all kinds, such as apples, currants, grapes, etc. Cider, currant and grape wine, etc., may be readily made for private use. From 6 to 12 barrels of cider can be made per day, by one man. The grinding is done by merely turning a crank. The pressing is effected by a powerful screw and lever. The machine occupies a space of only 2 1-2 by 3 feet, and weighs but 370 lbs. all complete. It is therefore very compact. Price \$25 and up. For family use, in town or country, machines of this kind are "just the thing."

#### Car Springs.

F. M. Ray, of this city, exhibits large operating models of his volute car springs. Their elasticity and strength is shown by placing them under long levers, heavily weighted. We have seen a number of testimonials from experienced railroad officers, whose companies have these springs in use, and they speak of them in the highest terms. We understand Mr. Ray has an extensive demand for the spring, and that it gives full satisfaction.

P. G. Gardiner, of this city, also exhibits his newly patented volute springs for cars and other purposes. They are highly spoken of, and extensively manufactured.

Jno. W. Adams, of Harlem, N. Y., exhibits his new spring for cars, etc. It is composed of convex disks of steel placed between solid plates of iron. A very excellent spring is thus obtained, strong, durable, and comparatively cheap.

Speed and Bailey, Jersey City, N. J., exhibit their new corrugated plate car springs, which are composed of small metallic plates, having corrugated surfaces. The plates are piled together, and appear to form excellent springs.

#### Hall's Power Loom.

Another new Power Loom called the "Vic Loom," has been placed on exhibition. By certain devices in this loom, when the reed is beating up the filling, it is perfectly firm, but it will afterwards liberate itself entirely, and swing back, if the shuttle should be obstructed or fail to pass through the warp. All breakage or injury to the web by the obstruction of the shuttle in its race is in this manner prevented, and the common protector dispensed with. This loom can, therefore, be run at a very high, and also at a low velocity—from 80 to 220 picks per minute—without any rearrangement of its parts. It is a good loom, and occupies six inches less space than the common ones—an important advantage. The inventor is Elijah Hall, of Rochester, N. Y.; it was patented on the 12th of February last, and the price is only \$55. Some of these looms are now in operation at Jones' Cotton Mill, Rochester, N. Y., and in Harmony Mills, Cohoes, N. Y., and another in the Steam Mill, at Newburg, N. Y.

Manufacturers of cotton cloth visiting the Fair, cannot but be favorably impressed with the improvements embraced in all the looms on exhibition. The parallel picker-staff motion of the Stockport looms has no equal, and the reed arrangement of Hall's loom is a peculiar and excellent invention. Patents for both looms were obtained through the Scientific American Patent Agency.

#### India Rubber Manufactures.

Vulcanized India Rubber fabrics are among the most astonishing triumphs of modern inventive genius, enterprise, and skill, and they had their origin and have their principal seats of manufacture in the United States. It is not many years since that all india rubber was only used for was erasing pencil marks from white paper; now it is manufactured into every variety of form, and applied to a countless number of useful purposes.

The united India Rubber Companies of our country make an excellent display of their goods in the North-West Gallery of the Palace; we have endeavored to collect a list of them, to show its adaptable character. The articles on exhibition consist of coats, pants, carriage cloths, piano and table covers, (beautifully printed in various colors) blankets, saddle and gas bags, aprons, beds, pillows, boots and shoes, hose and tubing, life-preservers, bath mats, water buckets, hats and caps, bottles, drinking cups, diving, or submarine dresses, (one shown suspended, with a diver's

helmet,) breast pumps, nursing bottles, cupping cups, water bags, gloves, all kinds of toys, balls, combs, packing for steam engines, belting for machinery, pencil cases, pen holders, pulleys, insulated telegraph wire, and valises in imitation of morocco leather. The nature of india rubber renders every article to which it is applied air and water tight, elastic, tough, and strong, not liable to be affected with the weather. These are qualities of an important and useful character. A very small amount of the india rubber in each article is sufficient to impart air and water-tight qualities to it; in fact, some india rubber goods, such as overshoes, contain but a minimum of the gum elastic, the rest being very cheap materials—hence enormous profits have been derived by the manufacturers of such goods. The best valve packing is made of 30 lbs. of india rubber, 6 lbs. of lampblack, 22 lbs. red or white lead, and 22 oz. of sulphur; these metalizing substances are all very cheap. India rubber is easily rendered plastic, and combines readily with almost every substance, such as the oxides of metals, clay, pulverized sand, gums, carbon, sawdust, ground cork, &c. It is, certainly, one of the most wonderful and useful products of nature that has ever been applied to the arts.

#### Trial of Fire Engines.

Trials of steam fire engines took place last week at the Crystal Palace, in competition for the gold medal, between the machine of Lee & Learned, New York, and that of Sillsby, Mynderse & Co. of Seneca Falls, N. Y. These were the only steam fire engines exhibited.

Steam was raised to 45 lbs. pressure in Lee & Learned's machine in 11 1-4 minutes after lighting the fire, and the engine commenced throwing water. Through 65 feet of hose and a 1 3-8 inch nozzle, the distance thrown was 125 feet, and with a 1 1-4 inch nozzle, 178 feet horizontally.

Sillsby, Mynderse and Co.'s machine exhibited a pressure of 35 lbs. of steam in 24 minutes after lighting the fire, and threw the water 115 and 179 feet. This trial took place on Wednesday, and was not deemed satisfactory by Messrs. Sillsby & Mynderse. Another trial was, therefore, agreed to be made at 2 o'clock P. M. on Saturday.

On this occasion the engine of Lee & Learned commenced playing in 7 minutes after the fire was lighted, and in 10 1-2 minutes had a pressure of 140 lbs. in the boiler. It threw a stream horizontally of 171 feet 10 inches, out of a 1 1-4 inch. nozzle—solid column 120 feet; out of an 1 1-2 inch nozzle it threw a stream of 172 feet 4 inches—solid column, 116 feet.

Sillsby & Mynderse's machine commenced to play in 14 1-2 minutes after the fire was kindled. It threw a stream 167 feet horizontally out of a 1 1-4 inch nozzle—solid column 126 feet 4 inches. It played 20 minutes, when the steam got very low, and it then stopped. It did not do so very well as on the previous trial. It could not generate steam in sufficient quantities to work it; while the engine of L. & L. from the moment it commenced working, never ceased, and seemed to have no difficulty in generating plenty of steam.

This was a very exciting trial. The place selected was alongside of the Croton Reservoir, outside of the Palace, and there was a great crowd present.

#### A Destructive Freshet.

It is difficult to account for the unexpected falls of rain which take place some times in certain localities. Thus the northern part of this State was visited with tremendous rains during the last week of September, by which great damage to property has been caused by the sudden and great rise of certain streams and rivers. The Essex County Republican states that the Ausable river rose higher than it was ever known before, and as there is a great deal of manufacturing carried on along its banks, much damage has been done. The dam at Keeseville was carried away, and saw mills, grist mills, nail works, machine shops, and rolling mills were destroyed. At Clintonville a number of factories and saw mills were nearly destroyed; at Ausable Forks the destruction of property was also very great, and more lamentable than all, nine persons were drowned.



**C. A., of Mo.**—The greatest depth of descent by a diving bell recorded, so far as we know, was 170 feet. The figures to which you refer represent dollars and cents. Biot & Guy Lussac ascended 13,000 feet in a balloon—the greatest balloon elevation known to us.

**G. H. B., of N. Y.**—Smoke is the result of imperfect combustion. Oxygen is the only element in nature to mix with your fuel to consume it. If you supply your fire with a greater quantity of air, and heat it before admitting it to the fire, such as by conducting it through tubes under the bottom of the grate, you will get rid of smoke.

**B. A., of N. Y.**—We published all we knew respecting the sewing machine.

**C. H. W., of N. C.**—The machine for making ice, to which you allude, is in Cleveland, Ohio, at the Sheboygan Works. We are not acquainted with its construction, but have no doubt that chemicals are used in it to produce a low degree of temperature. We believe that it cannot make ice as cheap as has been represented. A machine or process that could make ice cheap, would, as you state, be a grand acquisition to those regions, but such a machine, so far as our knowledge extends, has yet to be invented.

**W. J. C., of N. C.**—Hutchison's method of straining saws with a spring, illustrated on page 28, our last volume, is simple and good. Any of the plans for straining reciprocating saws, illustrated in our last volume, are good. It is impossible to tell which is the best, without practically testing it, and the same, we may add, is the case with re-action wheels for sawing and grinding purposes. Apply to the makers of them—those who have advertised in our columns, and those whose wheels have been illustrated—and bargain with the one who will fulfill the best conditions.

**A. S., of Ky.**—The article you send, on steam boiler explosions, was noticed by us when first published in the Intelligencer. It is not correct in its premises.

**J. J. J., of Ala.**—Bulkeley's Kiln-Drying Apparatus is a good one, we believe. We would advise you to address him: H. G. Bulkeley, Kalamazoo, Mich.

**W. M. C., of Tenn.**—We do not know that there is any demand for cedar bedsteads in this city.

**G. W. H., of Ill.**—Your offer is liberal, but we are not in a position to accept of it.

**L. B. F., of Mich.**—You want to know how to make blue and white colors for printing figures on muslin to be embroidered. Grind up some prussian blue, sold by all the druggists, into powder, and then mix it with a little gum water; use fine whitening in the same manner for your white color. These will answer your purpose. A little starch well boiled will answer as well as the gum.

**J. J. W., of Ill.**—You want to know the power of the water in your spring, which runs at the rate of 120 gallons per minute, and has a total fall of 27 1/2 feet. It is exactly one-horse power, from which one-fourth would have to be deducted if applied to a wheel. You also want to know how many pounds pressure on the piston of a steam engine 8 inches in diameter and 20-inch stroke, will be equal to the power of your spring. Such a comparison is curious, for with an engine of that size (and at a high pressure, as you state) a pressure of 10 lbs. on the square inch, and running only at the rate of 20 revolutions per minute is more than one horse power.

**T. M. G., of Pa.**—Send on your sketch for examination without delay. We make no charge for examining inventions and giving opinions in regard to their novelty. Inventors who wish to consult us on such matters, can do so freely, and we will furnish them with a printed circular of information free of charge. By delaying to secure your invention in time some one may get ahead of you. This is often done. We have the most extensive Patent Agency in the world, and our prices for preparing cases are very moderate.

**A. G. C., of Vt.**—Your invention patented in 1843, embracing a claim for the combined use of steam and air, or steam alone, in a blast or other furnace, is quite different from that which has received the name of the "Bessemer process." It embraces a blast of air or steam and air, through the liquid metal, after it has been run from the furnace. The use of steam as a blast was patented in England in 1840.

**G. B. O., of —**—Perforated plates are now used in some ovens.

**G. P., of Mich.**—We have the work of Liebig to which you refer, and referred to his opinions some years since, to sustain our views in a controversy respecting electro-magnetism as a motive power. We are obliged to you for your offer, however.

**J. T., of Ohio.**—Use common plumber's solder to make the swell joints of lead pipes. It is composed of 66 parts of lead and 34 of tin.

**R. B., of Conn.**—Hunt's photography is published by Humphrey, 297 Broadway, this city, it is such a work as you want.

**N. K. L., of Ala.**—Hodge on the Steam Engine, is such a work as you want. It is published by D. Appleton & Co., this city. Price \$10.

**H. E. T., of N. Y.**—There is no theory in existence so far as we are aware, respecting "how much weight a pile of 800 lbs. will support under a ram of 1600 lbs. with a fall of 20 feet." Some of our readers may have adopted a theory on pile-driving from their own experience.

**C. D. L., of Ill.**—It is impossible for us to tell what quantity of water will flow through your ditch per minute, owing to its length, and having only six feet fall to the mile. The resistance of its sides and bottom to the passage of the water must be very great. If you, by experiment, will find out how much flows through it per minute, we will tell you what power it will take to raise it 100 feet high.

**H. B., of Mass.**—There are different kinds of iron ore, each of which require to be treated in a manner according to its nature, the carbonate must be treated in a different manner from the red or brown oxyd; therefore one process will not answer for all. The best iron is made from the magnetic oxyd.

**C. J. W., of Ohio.**—The sulphate of zinc is the best drier you can employ to mix with your paint.

**H. T., of Pa.**—Resin is soluble in an alkali, and makes a kind of a soap; it is employed extensively in making common brown soap.

**R. H. J., of Ky.**—The fiber of the cypress bark is not so white in color as jute or Indian hemp, but it is much stronger, and we think it might be made profitable to manufacture into small rope.

**W. McD., of N. C.**—Resin gas, we think, must be the cheapest for your State. It is easier to manufacture for public illumination than coal gas. You will find a full description of the method of manufacturing it in Parnell's Chemistry. Resin oil makes an excellent gas also, and as it is cheap in North Carolina it should be more extensively used. Many cotton factories at the North now use resin oil gas.

**R. H., of N. Y.**—Steam is employed in distilling various substances, such as coal oil, camphene, &c.

Money received at the Scientific American Office, on account of Patent Office business for the week ending Saturday, Oct. 18, 1856—

S. B. H., of N. Y., \$30; B. & P., of Wis., \$30; T. H., of Pa., \$30; J. J. P., of O., \$25; S. B. H., of N. Y., \$55; G. & F., of N. Y., \$30; J. H. Y., of Mo., \$25; D. & R., of N. Y., \$5; J. S., of Cal., \$30; E. & G., of Vt., \$30; G. C. Sd., of Conn., \$25; J. M. J., of Ala., \$10; L. S., of Conn., \$30; J. G. P., of N. Y., \$25; L. W. B., of N. Y., \$15; O. H. N., of N. Y., \$30; J. C. S., of Mass., \$25; V. N. M., of N. C., \$30; W. C., of L. I., \$30; G. W. D., of N. Y., \$30; C. W., of Conn., \$30; C. H. B., of N. Y., \$55; T. R. H., of Conn., \$55; J. T. B., of N. Y., \$25; G. S. B., of Conn., \$55; W. W., of N. Y., \$30; M. L., of N. Y., \$25; O. O. W., of N. Y., \$25; W. & M., of N. Y., \$25; G. F., of L. I., \$25; E. L. E., of Conn., \$20; F. & B., of N. Y., \$30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Oct. 18th—

J. J. P., of O.; M. L., of N. Y.; J. L., of Ohio; A. G. C., of Vt.; O. V. D. R., of Ill.; D. & R., of N. Y.; G. C., of Conn.; J. H. Y., of Mo.; H. G., of Canada; A. D. B., of Prussia; G. H., of L. I.; O. O. W., of N. Y.; W. & M., of N. Y.; G. F., of L. I.; F. & B., of N. Y.

#### Important Items.

Subscribers to the Scientific American who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication.

To the Press.—Any newspaper or publication which is entitled to the Scientific American on the terms prescribed in the Circular which was sent from this office a few weeks ago, and does not receive it regular, is requested to make complaint to this office, when the omission shall be promptly corrected.

INVENTORS SENDING MODELS to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies, either through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they maltreat their customers at each end of the route. Look out for them.

A WORD OF WARNING.—To those who have procrastinated in renewing their subscriptions, but still design to remit in a few days, we would say, be careful and not delay too long. The back numbers of the present volume are running low, and some of our friends are going to be disappointed, and by, when they send in their subscriptions, and order the back numbers, by a short reply back, "Back numbers all gone."

GIVE INTELLIGIBLE DIRECTIONS.—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

FORGOTTEN SUBSCRIBERS.—Our Canada and Nova Scotia patrons are solicited to compete with our citizens for the valuable prizes offered on the next volume. [It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to pre-pay on postage.]

PATENT LAWS AND GUIDE TO INVENTORS.—This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office Price 12 1/2 cents per copy. A Circular, giving instructions to inventors in regard to the size and proper construction of their models with other useful information to an applicant for a patent, is furnished gratis at this office upon application by mail.

RECEIPTS.—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and date of patent when known, and enclosing \$1 as fees for copying.

#### Terms of Advertising.

Twenty-five cents a line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

All advertisements must be paid for before inserting.

GRAND DISCOVERY, whereby the whole of the Boes in a bed can be driven down on to a sheet or board and remain insensible for 10 or 15 minutes, and by setting a weak stock live over them they will run up and make a strong family. The whole secret will be sent to any address by remitting one dollar by mail to the subscriber.

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CORN HUSKERS.—I will send one to any person on receipt of \$1. Warranted to save thirty to fifty per cent. of labor, and all core fingers. Patent pending. Address J. HERVA JONES, Rockton, Winnebago Co., Ill.

PLUMBEOIA Universal Patent Agency.—Plumbecia and Du Buque, Iowa.

SWISS DRAWING INSTRUMENTS.—A full stock of these celebrated instruments always on hand. Catalogues gratis. AMSLER & WILZ, 760ew 211 Chestnut st., Philadelphia.

## IMPORTANT TO INVENTORS.

THE UNDERSIGNED, having had Ten years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that he continues to offer their services to all who may desire to secure Patents at home or abroad.

Over three thousand letters Patent have been issued, whose papers were prepared at this Office, and on an average fifteen, or one-third of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Draftsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsel to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M. until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement, forwarded to us, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, at the proper time, in the Scientific American. This paper is read by not less than 100,000 persons every week, and enjoys a very wide and substantial influence.

Most of the patents obtained by Americans in foreign countries are secured through us, while it is well known that a very large proportion of all the patents applied for in the U. S., go through our Agency.

MUNN & CO., American and Foreign Patent Attorneys, Principal Office 128 Fulton street, New York.

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Book, Containing 150 Household Receipts, all of them practical, and most of them new to the public. Also accounts of several new discoveries and recent improvements interesting to Mechanics and Farmers. Also a condensed account of the most prominent diseases of the human body, what produces them, what will cure them, and why. Also 20 anatomical illustrations of the human body, conspicuously showing all the muscles, nerves, joints, blood vessels, heart, lungs, throat, brain, eye, ear, tongue, skin, bowels, and other interior organs. This book also contains a list of nearly 50 different rights comprising inventions, discoveries, and information which, in the opinion of the London Society of Arts, are now required by the public and for which inventions, &c., they offer valuable premiums. The List affords a brilliant opportunity for the display of American talent and genius. Every mechanic and artist should possess it. The above book will be sent free of postage on receipt of Ten cents or three stamps, by J. R. STAFFORD, Practical Chemist, No. 16 State st., New York.

BOONE'S PATENT ROPE MACHINE is an invention of great utility. Those who have had it in operation about six months, with a number of superintendants, who for workmanship have long been known to be at the head of their profession as rope manufacturers, unite in saying that it is by far the most superior machine for making small rope ever saw. It makes a superior article of rope, occupies but about one half the room, works at double the speed with about one half the power of any other machine they know of. The patent is dated July 15th, 1856. The inventor, T. L. Boone, 7 Nassau st., Brooklyn, N. Y., prefers making cordage with them to selling, but would sell the right of a few States low, to raise funds to build a mill of his own, or supply a company with machinery, with a State right to take part with them in a Rope and Cordage Manufactory.

SALE OF PATENTS.—Great Central Inventors, Machinery, and Patent Right Depot, No. 212 Broadway, cor. of Fulton st., New York. Our experience, disposing of rights, and extensive acquaintance throughout the Union has induced us to establish branch and connecting offices in all the principal cities; therefore we have superior facilities for the purchase and sale of machinery, and for the sale of such valuable patent rights and patented articles as will bear actual demonstration. Good reference given. Address A. & J. T. SPEER.

A REQUEST.—LIBERAL OFFER.—We propose to send to every person in the United States, who is interested in the manufacture of lumber, or improved machinery, a full illustrated description of two valuable inventions. First—

THE COMBINATION PORTABLE STEAM SAW-MILL.—This is a new upright mill, so simple in its construction that any one can put it up and run it—it is easily moved from place to place—may be easily shipped to any part of the country—is capable of cutting from six to ten thousand feet in every twenty-four hours. The inventor, T. L. Boone, 7 Nassau st., Brooklyn, N. Y., at the same time it is furnished at so low a rate as to bring it within the reach of almost every farmer and planter.

Second, RICE'S PATENT SPRING GUIDE.—The only effective plan ever invented for guiding, steadying, and strengthening a circular saw, while in motion. We wish, therefore, to obtain a list of all the machinists, lumbermen and saw-mill men in the United States, and to any person who will send us a list of such parties in his vicinity, and the address of each, we will send him a copy of the "United States Journal," the largest illustrated newspaper in the United States, for one year. In case we receive more than one list from the same locality, we shall send the "Journal" to the party from whom we receive the first list, only. The New England States are not included in this offer, as we have there already completed a list, as desired. J. M. EMERSON & CO., 1 Spruce street, New York.

S. D. BARNETT, Malleslie and Gray Iron Works, Hamilton cor. of W. 4th st., New York, N. J. Orders promptly attended to.

PATENT BUCKLE.—The double-jointed buckle patented Sept. 2d, 1856, is claimed to be the best invention in the way of buckles for wearing apparel, suspenders, &c., that has ever been produced. The entire patent, or territory in States may be bought cheap of the State. Address for further particulars, WILLIAM SLADE, Gum Creek, Dooley Co., Ga.

PORTABLE STEAM ENGINE.—S. C. HILLS No. 12 Platt st., N. Y., offers for sale these Engines, with Boilers, Pumps, Heaters, etc., all complete, and very compact, from 3 to 10 horse power, suitable for printing, carpenters, farmers, planters, &c. A 2 1/2 horse can be seen in store. It occupies a space 5 by 3 feet, weighs 500 lbs., price \$250; other sizes in proportion. 1 ewf

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometer, Dugan's Hydraulic Lifting Press, Seebing's Patent Wire Rope for hoisting and steering purposes. Machinery Oil of the most approved kind, etc. CHARLES W. COPELAND, Consulting Engineer, 64 Broadway.

CLOCKS for Churches, Court Houses, &c. Regulators and time pieces for jewelers, railroads, offices, &c. Also glass dials of any size for illuminating, and other kinds manufactured and warranted by the subscriber. JOHN SHERRY, Oakland Works, Sag Harbor, N. Y. 12 ewf

CLARK'S PATENT WATER REGULATOR.—The only perfect security against boiler explosions caused by want of water. Every steam boiler should have one. Regulators sold and applied and rights for most of the States and Territories, for sale by S. C. HILLS, 12 Platt st., N. Y. 1 4eww

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SUPERIOR MACHINISTS TOOLS.—Slotting machines, Planers, Compound Planers, Lathes, Drills, Gear Cutters, &c., &c., constantly on hand, and made to order at short notice by CARPENTER & PLASS, 479 First Avenue, N. Y.

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TO INVENTORS AND PATENTEES.—The undersigned has established an agency for the sale of patent rights in the City of Baltimore, at No. 38, 3rd street. PHILIP T. TYSON.

IMPROVEMENT IN BORING MACHINES.—This improvement consists of an arrangement by which the sugar can be driven in any direction the operator chooses, rendering the machine far superior to any other now in use. RICE & DRYDEN, Worcester, Mass.

MACHINE BELTING, Steam Packing, Engine Hose.—The superiority of these articles manufactured of vulcanized rubber is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The hose never needs oiling, and is warranted to stand any required pressure, together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise, at our warehouses. New York Belting and Packing Co., JOHN H. CREEVER, Treasurer, No. 8 Dey street, N. Y.

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50 STEAM ENGINES.—From 3 to 40-horse power also portable engines and boilers; they are first class engines, and will be sold cheap for cash. WM. REDON, 142 Front st., Brooklyn.

GOLD QUARTZ MILLS of the most improved construction; will crush more quartz and do it faster than any machine now in use, and costs much less. WM. BURDON, 142 Front st., Brooklyn.

VAIL'S CELEBRATED PORTABLE STEAM Engines and Saw Mills, Bogardus' Horsepower, Saw Machines, Saw and Grist Mill Irons and Gearings, Saw Gumpers, Hatchet Drills, &c. Orders for light and heavy forging and castings executed with dispatch. LOGAN & LIDGERWOOD, 13 1y 2 Gold st., N. Y.

PAGE'S PATENT CIRCULAR SAW MILLS with Steam Engine and Boiler on hand and for sale for \$1500, at Schenck Machine Depot, 143 Greenwich st., New York. A. L. ACKERMAN.

BARREL MACHINERY.—CROZIER'S PATENT is unrivalled in point of quality and quantity of work executed, and may be seen in constant operation at the Barrel Manufactory of the undersigned. For rights and machines address WELCH & CROZIER, Oswego, N. Y.

TO CAR BUILDERS.—For Sale, one new Upright Boring Mill for boring car wheels. Maker's price \$300, will be sold for \$200 cash. Address GEO. S. COLN & CO., Hartford, Ct.

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OIL! OIL! OIL!—For railroads, steamers, and for machinery and burning—Fess's Improved Machinery and Burning Oil will save fifty per cent. and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturers: F. S. PEASE, 61 Main st., Buffalo, N. Y. And W. S. ROWLAND & CO., Agents for Chicago, Ill. N. B.—Reliable orders filled for any part of the United States and Europe.

NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., in the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS, Office for sale of rights at 27 State street, Boston, and Lowell, Mass.

NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engines and Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co., New Haven, Conn."

HARRISON'S 30 INCH GRAIN MILLS.—Last Patent.—A supply constantly on hand. Price \$300. Address New Haven Manufacturing Co., New Haven, Conn.

BOILER INCURSTATIONS PREVENTED.—A simple and cheap condenser manufactured by Wm. Burdon, 142 Front st., Brooklyn, will take every particles of lime or salt out of the water rendering it as pure as Croton, before entering the boiler. Persons in want of such machines will please state what the bore and strokes of the engines are, and what kind of water be used.

## Science and Art.

## Natural Curiosities.

In Australia there is a beetle which has the peculiarly formed legs of the Kangaroo, and appears to be half kangaroo (on a small scale) and half insect. It is a grotesque creature, and from its appearance has received the name of "Kangaroo-Beetle."

In the same country there is also a bird (*Menura superba*) which has a tail resembling the ancient Greek lyre. The margin of the lyre is formed by two broad feathers on each side, which curve into scrolls at the upper end, while a number of delicate ones represent the wires in the middle. These birds are hunted for their tails, which form an object of curiosity and beauty in museums.

In the zoological kingdom there is a curious variety of shell called "Harpa," from the bars with which it is marked having the resemblance of a harp. There is another shell called the "Bulina," which resembles a rose bud, and another which resembles a strawberry.

## London and Old Rome.

Rome in the days of its glory was a magnificent and great city, but historical students assert that London already surpasses what that city was in her palmy days. London has a population of 2,500,000, and what is very remarkable, it increases proportionably faster than any city in England. If it goes on increasing for half a century as it has during the past 50 years, it will then have a population of six millions. The Commissioners of Sewers in that city are now providing drainage for such a population. What a human hive!

## Improvement in Paddle Wheels.

Abraham Houseworth, of 259 Houston st., N. Y., has now on exhibition at the Great Fair of the American Institute, Crystal Palace, N. Y., his improvement in Paddle Wheels, for which Letters Patent were granted Aug. 19th, 1856. Our engraving illustrates the improvement.

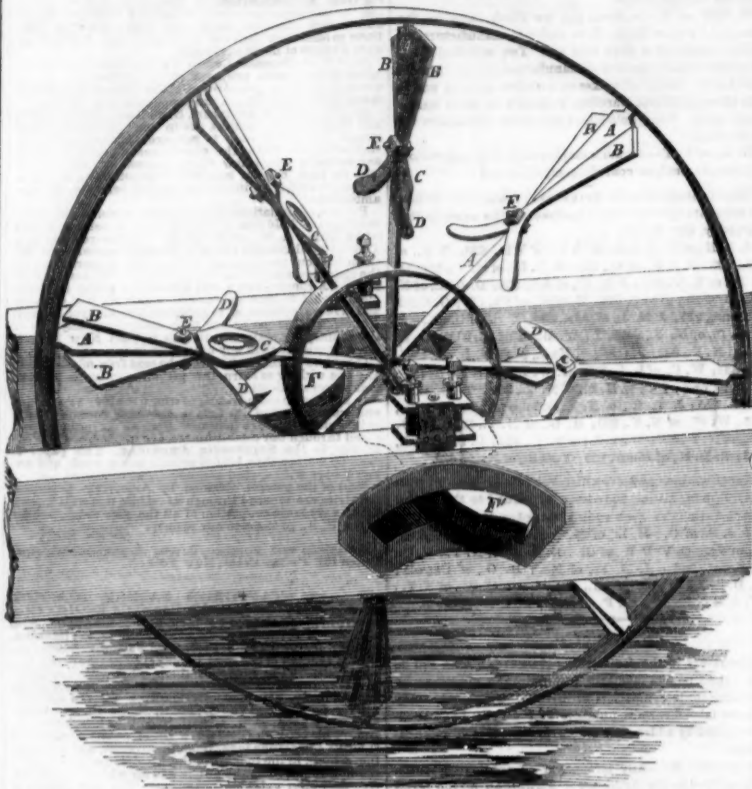
The principal objects of the invention are to prevent the injurious concussion and jarring caused by the common paddles in the act of entering the water; also to avoid the loss of power by the lifting of the back water, when the paddles emerge. For this purpose the paddles are made in three parts, the central portions, A, forming the spokes of the wheel, and the other portions, B B, being pivoted at E in pairs to A. The inner extremities of B B are furnished with projecting arms, C D, which are intended to strike upon the cam, F, as the wheel revolves and open the paddles. The opening or spread of the floats, B B, takes place just after they have entered the water. At the moment of entering the floats are folded together, so that only one-third of their actual surface is presented to the water, but after entering, the cam, F, causes them to open, or spread, so as to treble the propelling surface. In the act of emerging the paddles close again, and thus avoid the lifting of back water. When, therefore, the paddles reach that point where the greatest surface is needed, and where the power of the engine can be most advantageously employed, they open as described, but close in time to obviate the other difficulties named.

The cam, F, is movable, by means of its shank, F', which passes through a slot in the supporting beam for that purpose.

When it is desired to reverse the motion of the wheel, cam F is shifted to the opposite end of said slot. If cam F be moved so that its shank occupies the center of the slot, the floats will remain closed during the entire revolution of the wheel. The inventor proposes to make an advantageous use of this fact. By means of suitable rods and connections he will cause the cams to be shifted by a lever, located in the pilot-house of the boat, so that the pilot can, at pleasure, instantly alter the power of one or both wheels without causing the speed of the engine to be changed. If the paddles of one wheel are folded, and those of the other spread open, it is evident that greater force will be exerted on one side than the other, and that the vessel may be

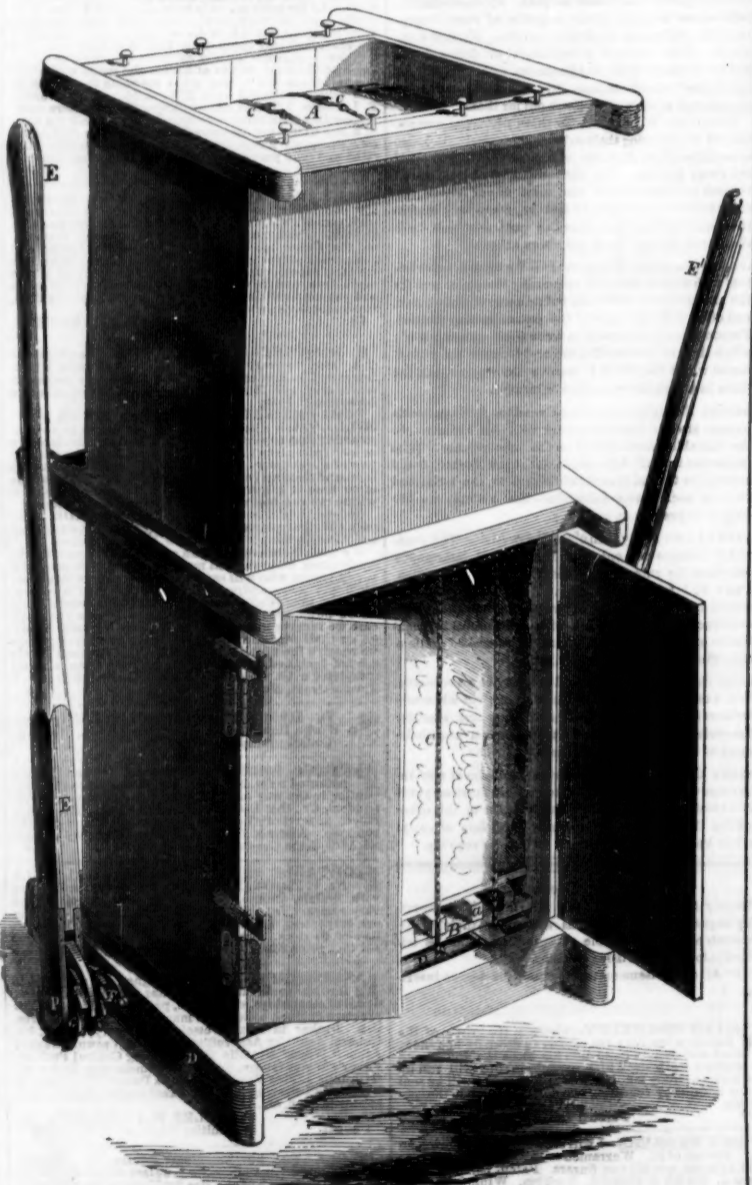
more quickly turned. Or the paddles of both wheels may be prevented from spreading, and the vessel's speed instantly reduced. Instead of single arms, A, the inventor proposes to have two arms of similar shape, and wearing at the pivot, etc. For further information apply at the Palace or address the inventor, as above.

## NEW PADDLE WHEEL.



poses to have two arms of similar shape, and wearing at the pivot, etc. For further information apply at the Palace or address the inventor, as above.

## PRESS FOR HAY AND COTTON.



Cotton and Hay Press.

Our engraving is taken from a full-sized Press now on exhibition at the Crystal Palace. The chief merit of the improvement consists

in its simplicity, cheapness of construction, durability and great power. The substance to be pressed is placed between the follower, A, and bottom board, B. The pres-

sure is obtained by means of chains or cords, C, which extend over the follower, A, their ends winding upon roller shafts, D. There are two of these roller shafts, D, one on each side of the machine. They are rotated, respectively, by the levers, E E'. The roller shafts, D, project from the sides of the machine, far enough to receive the ratchet wheel and pawl, F, and also to receive the lower ends of levers E, which also have a ratchet and pawl, G. The office of the ratchet wheel and pawl, G, is to convey motion to shafts D, when power is applied to levers E E'. The pressure is retained by ratchet wheel and pawl F.

Whenever the shafts, D, are rotated in the proper direction, the cords, C, will be wound up, and the follower, A, pressed down towards the bottom board B. The degree of pressure is only limited by the length of the levers, E E' and the strength of the materials of which the machine is composed. The bottom board, B, is furnished with ribs, a, between which cords for binding the bales are passed. The under side of follower, A, is similarly provided.

It is almost needless to say that there are no parts connected with this machine that are likely to get out of order. Its compactness, ease of management, and economy of manufacture, with the other advantages described, render it worthy of public favor. For further information address the inventor Jas. A. Disbrow, Poughkeepsie, N. Y. Patent applied for.

The Selma (Ala.) Gazette states that M. Dillard of that place, has grown 80 acres of "Boyd Cotton" this season, the yield of which has been very great—100 well-formed bolls being formed on a single stalk, on an average.



OF THE

SCIENTIFIC AMERICAN.

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